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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,969	01/05/2007	Takanori Ichiki	2114-0117PUS1	5623
2292 7590 10/14/2010 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER TAL XIYU				
ART UNIT 1759		PAPER NUMBER		
NOTIFICATION DATE 10/14/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/590,969

**Applicant(s)**

ICHIKI, TAKANORI

**Examiner**

Xiuyu Tai

**Art Unit**

1759

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 8-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/200)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 1/4/2007.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 8-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/26/2010.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "a VHF power supply" as cited in claim 1, "a conductor" as cited in claim 4, and "a high voltage generating unit" as cited in claim 7 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiki (JP 2002-257785, cited in IDS) in view of Yin et al ("Miniaturization of Inductively coupled plasma sources", IEEE TRANSACTIONS ON PLASMA SCIENCE. VOL. 27, NO. 5, 1999, page 1516-1524).

4. Regarding claim 1, Ichiki discloses a micro plasma source (ABSTRACT). The micro plasma source by VHF drive for generating inductive coupling plasma (paragraph [0016]) comprises:

- (1) a substrate 1 (Drawing 1, paragraph [00116]);

- (2) a planar antenna 3 on the substrate 1 (Drawing 1, paragraph [0016]); and
- (3) a discharge tube 2 near to the antenna 3 (Drawing 1, paragraph [0016]).

Ichiki teaches the antenna 3 having a flat meandering shape with one turn, but does not teach the antenna 3 having a plurality of turns. However, Yin et al disclose a miniature inductive coupled plasma source (ABSTRACT). Yin teaches that the miniature ICP is formed from a 20-turn coil (the last paragraph on page 1516). Yin also indicates that the planar coil with plural turns improves efficiency (the first paragraph in SECTION B on page 1517). Therefore, it would be obvious for one having ordinary skill in the art to utilize plural turns of planar coil as suggested by Yin in order to improve the efficiency of Ichiki.

- 5. Regarding claim 2, the plural turn of planar coil (i.e. antenna) of Yin is near to the edge of the substrate (Figure 3 on page 1518).
- 6. Regarding claim 3, Ichiki teaches a copper plating layer (paragraph [0016]).
- 7. Regarding claim 4, Ichiki/Yin does not specifically disclose the relationship between the thickness of the plating layer and the depth. However, Yin teaches that the optimized efficiency of the miniature ICP may be controlled by designing proper coil geometry and certain power output (SECTION B on page 1517). Therefore, one having ordinary skill in the art would have realized to optimize the thickness of the plating layer and the depth of Ichiki/Yin in order to achieve better efficiency.

With respect to the cited equation, It represents optimization of the miniature ICP based on process-limiting parameters, such as the properties of the metal, and the

operating frequency. One having ordinary skill in the art would have realized to optimize the ICP design in order to improve efficiency of Ichiki/Yin.

8. Regarding claim 7, Yin teaches high voltage provided to the miniature ICP (Figure 3, SECTION C on page 1518).
9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiki (JP 2002-257785, cited in IDS) and Yin et al as applied to claim 1 above, and further in view of Moslehi (PG-PUB US 2001/0047760).
10. Regarding claim 5, Ichiki/Yin teaches the substrate made of quartz (paragraph [0016] of Ichiki), but does not teach the substrate being made of the material as claimed. However, Moslehi discloses an apparatus for ICP (induction coupled plasma) generation (ABSTRACT). Moslehi teaches that the ICP source with coils requires the plasma source wall/substrate made of quartz tube or alumina tube (paragraph [0006]). The teaching of Moslehi shows that an alumina substrate for ICP source is an equivalent structure to that of quartz substrate. Therefore, one having ordinary skill in the art would have found it obvious to substitute the quartz substrate with an alumina substrate because they are art-recognized equivalent.
11. Regarding claim 6, Moslehi teaches an alumina substrate (paragraph [0006]).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/X. T./  
Examiner, Art Unit 1759

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1723